

User Manual

Revision 1.030
English

Gateway M-Bus from/to Modbus TCP Server (to connect a Modbus TCP Client)

(Order Code: HD67044M, HD67044M-40, HD67044M-80,
HD67044M-160, HD67044M-250)

for Website information:

www.adfweb.com?Product=HD67044M

for Price information:

www.adfweb.com?Price=HD67044M

www.adfweb.com?Price=HD67044M-40

www.adfweb.com?Price=HD67044M-80

www.adfweb.com?Price=HD67044M-160

www.adfweb.com?Price=HD67044M-250

Benefits and Main Features:

- ▶ Very easy to configure
- ▶ Up to 250 standard M-Bus devices connected to the Gateway
- ▶ Power Supply 15...21V AC or 18...35V DC
- ▶ Industrial temperature range:
-30°C / 70°C (-22°F / 158°F)

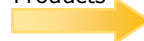


HD67044M



HD67044M-xxx

Similar
Products



For other M-Bus products see also the following link:

Converter M-Bus to

www.adfweb.com?Product=HD67021

(RS232)

www.adfweb.com?Product=HD67022

(RS485)

www.adfweb.com?Product=HD67030

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Analyzer & Scanner M-Bus

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Extender and Repeater, M-Bus

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Gateway M-Bus / Modbus RTU

www.adfweb.com?Product=HD67029M-232

(on RS232)

www.adfweb.com?Product=HD67029M-485

(on RS485)

Gateway M-Bus / PROFIBUS

www.adfweb.com?Product=HD67053M

Gateway M-Bus Concentrator

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Gateway M-Bus Slave / Modbus RTU master

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Do you need to choose a device? do you want help?

Ask it to the following link: www.adfweb.com?Cmd=helpme

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UPDATED DOCUMENTATION:

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- Updated
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To obtain the most recently updated document, note the "document code" that appears at the top right-hand corner of each page of this document.

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REVISION LIST:

| Revision | Date | Author | Chapter | Description |
|----------|------------|--------|---------|------------------------------|
| 1.010 | 25/03/2010 | FI | All | New software version (1.200) |
| 1.020 | 30/03/2010 | Ft | All | Revision |
| 1.021 | 22/10/2010 | FI | All | Revision |
| 1.030 | 04/03/2011 | FI | All | Software changed (v1.300) |

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CONNECTION SCHEME:

Order Code: **HD67044M**

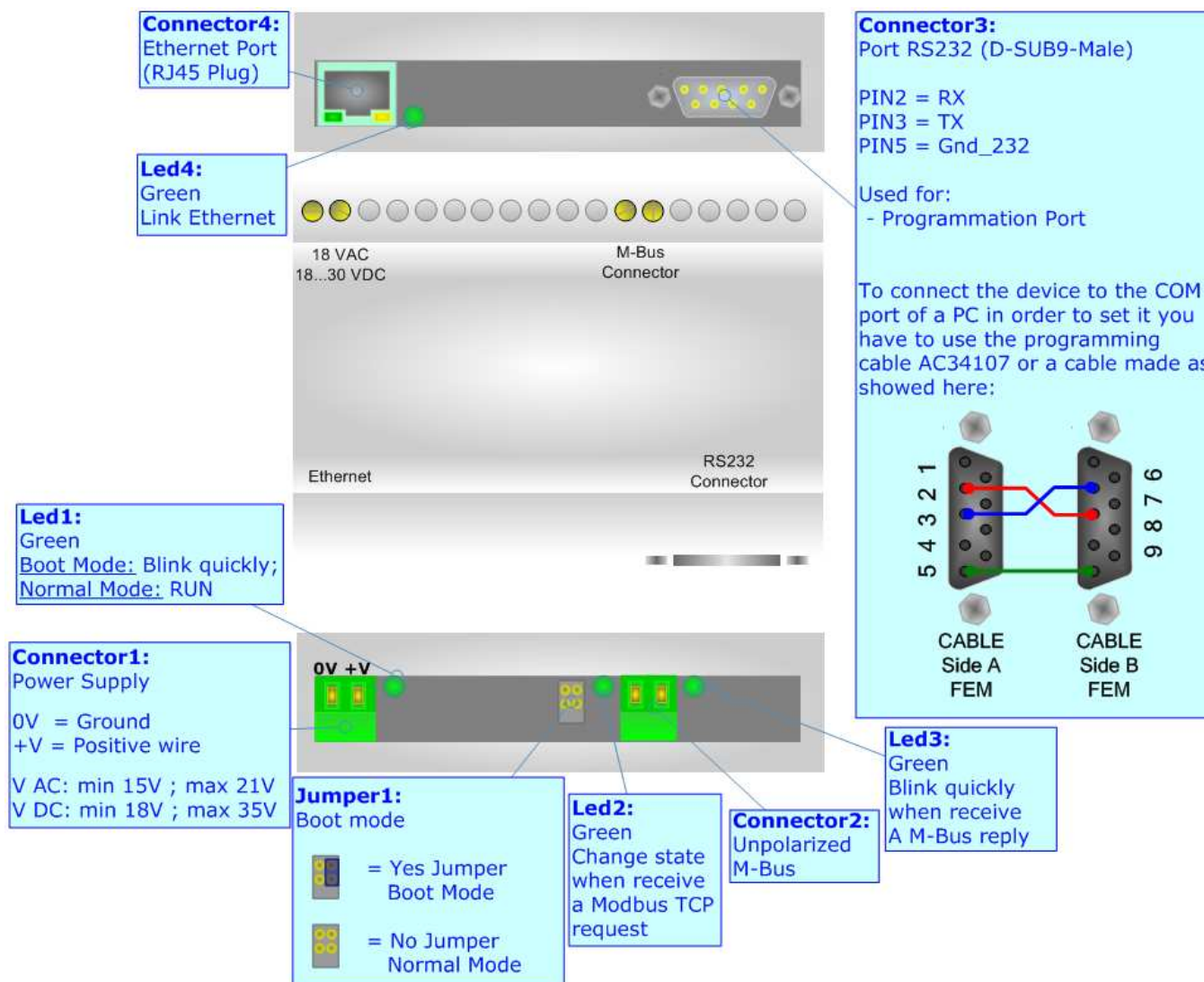


Figure 1: Connection scheme for HD67044M

Order Code: **HD67044M-40**
 Order Code: **HD67044M-80**
 Order Code: **HD67044M-160**
 Order Code: **HD67044M-250**

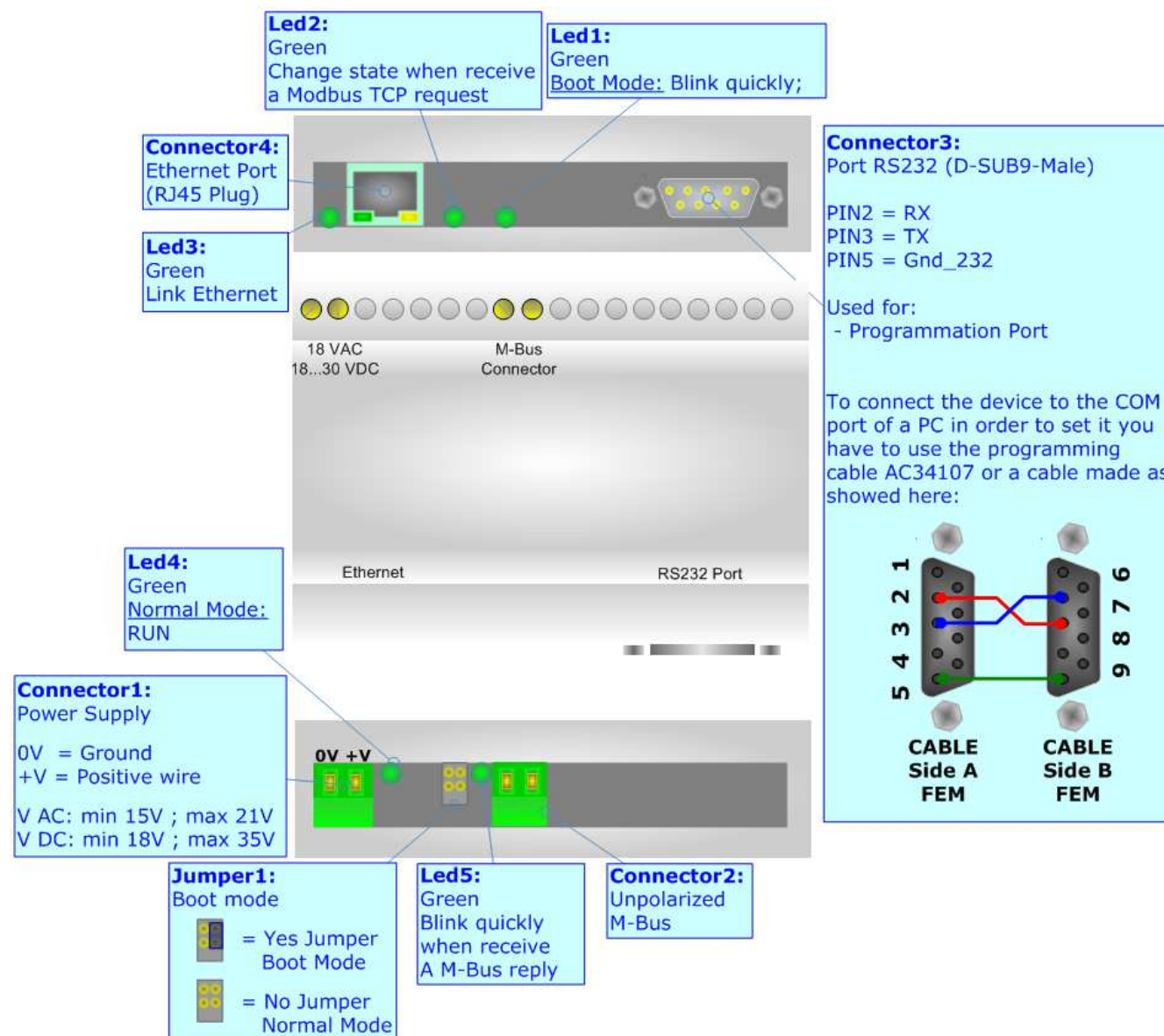


Figure 2: Connection scheme for HD67044M-xxx

CHARACTERISTICS:

The HD67044M is a Gateway M-Bus to Modbus TCP Server.
It allows the following characteristics:

- Baud Rate and Parity changeable with software;
- Mountable on Rail DIN;
- Power Supply 15...21V AC or 18...35V DC;
- Temperature range -30°C to 70°C.

At the Adapters can be connected up to 250 standard M-Bus devices. This number depends of the code expressed by the xxx number:

- HD67044 support up to 20 M-Bus devices;
- HD67044-40 support up to 40 M-Bus devices;
- HD67044-80 support up to 80 M-Bus devices;
- HD67044-160 support up to 160 M-Bus devices;
- HD67044-250 support up to 250 M-Bus devices.





In the case of HD67044-160 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air.



In the case of HD67044-250 the device must be mounted on 35mm DIN rail which is horizontally mounted on a wall or cabinet back-plate. These units have a fan in the top of the enclosure. To avoid obstructions to the airflow around the unit it is recommended to not cover the paths of air. Take care to not cover the fan. It is recommended to put the device into a ventilated cabinet.

POWER SUPPLY:

The devices can be powered at 15...21V AC and 18...35V DC. The consumption depends to the code of the device. For more details see the two tables below.

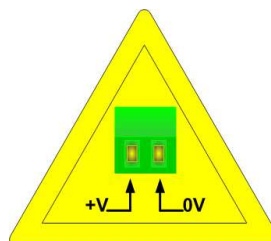
| VAC  | | VDC  | |
|---|------|---|------|
| Vmin | Vmax | Vmin | Vmax |
| 15V | 21V | 18V | 35V |

Consumption at 24V DC:

| Device | No Load [W/VA] | Full Load [W/VA]* |
|-------------|----------------|-------------------|
| HD67044 | 3.5 | 4 |
| HD67044-40 | | 5 |
| HD67044-80 | | 8 |
| HD67044-160 | | 14 |
| HD67044-250 | | 30 |

* This value is with all the Slave M-Bus devices of the code (20, 40, 80, 160, 250) connected to the line

Caution: Not reverse the polarity power



HD67044-xxx

SET COMMUNICATION PARAMETERS:

Configurable Parameters:

- Baud Rate;
- Parity.

Fixed Parameters:

- 1 Bit Start;
- 8 Bit Data;
- 1 Bit Stop.

The Baud Rate and the Parity of M-Bus are configurable with the software.

CONFIGURATION:

You need Compositor SW67044 software on your PC in order to perform the following:

- Define the parameter of Modbus TCP line;
- Define the parameter of M-Bus line;
- Define which Modbus register contain the M-Bus information;
- Update the device.

FUNCTION MODES:

For the device HD67044M it is possible to update the microprocessor program. Therefore there are two functions to select from the boot jumper:

- NORMAL MODE (factory setting, without BOOT jumper): with this setting the HD67044M is able to function as an adapter M-Bus to Ethernet;
- BOOT MODE (with BOOT jumper): the boot mode is activated when the HD67044M is turned on. Eventual program updates are available on the site www.adfweb.com

When the run LED blinks at frequency of about 1 second, the device functions in Normal Mode, otherwise if the run LED blinks more quickly the device is in Boot Mode.

USE OF COMPOSITOR SW67044:

To configure the Gateway, use the available software that runs with Windows, called SW67044. It is downloadable on the site www.adfweb.com and its operation is described in this document.

When launching the SW67044 the right window appears (Fig. 3).

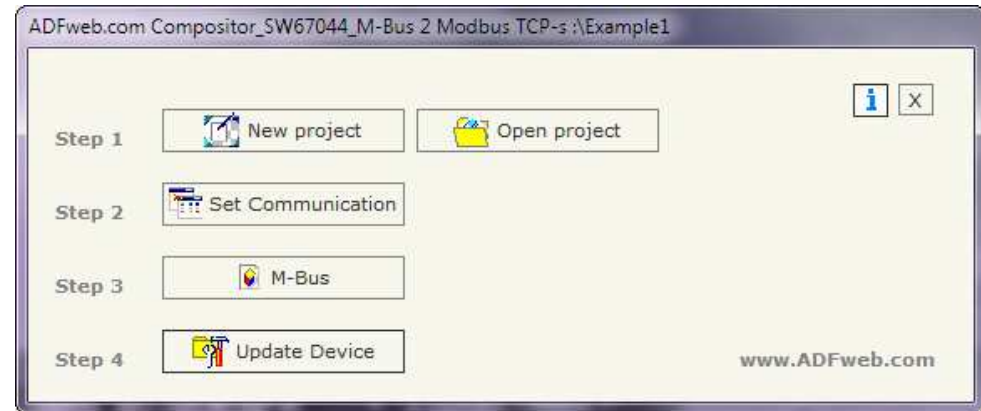


Figure 3: Main window for SW67044

NEW PROJECT / OPEN PROJECT:

The "**New Project**" button creates the folder which contains the entire device configuration.
A device configuration can also be imported or exported:

- To clone the configurations of a Programmable M-Bus to Modbus TCP Server Gateway in order to configure another device in the same manner, it is necessary to maintain the folder and all its contents;
- To clone a project in order to obtain a different version of the project, it is sufficient to duplicate the project folder with another name and open the new folder with the button "**Open Project**";
- When a new project is created or an existent project is open, it will be possible to access the various configuration sections of the software:
 - "**Set Communication**";
 - "**M-Bus**";
 - "**Update Device**".

SET COMMUNICATION:

This section define the fundamental communication parameters of two Buses, Modbus and M-Bus.

By Pressing the "**Set Communication**" button from the main window for SW67044 (Fig. 3) the window "Set Communication" appears (Fig. 4).

The window is divided in two sections, one for the Modbus TCP (Ethernet) and the other for the M-Bus.

The means of the fields for Ethernet are:

- In the field "**IP Address**" insert the IP address of the device;
- In the field "**Subnet Mask**" insert the Subnet Mask;
- If the field "**Gateway**" is checked it is possible to insert, in the field under, the IP Address of the gateway used for going out to the net;
- In the field "**TCP Port**" insert the number of the port used for communicate.

The means of the fields for M-Bus are:

- In the field "**Baudrate**" the velocity of the M-Bus line in use is defined;
- In the field "**Parity**" the parity of the M-Bus line is defined;
- If the field "**M-Bus Poll on request**" is checked, the Gateway makes the request only if a Modbus register is requested; otherwise if "**Cyclic request**" is checked, the Gateway makes the request in M-bus network each time the time defined under passes;
- In the field "**Delay**" insert a time expressed in seconds. This time is used for the "Cyclic request".

The screenshot shows the 'SET COMMUNICATION' dialog box. It has two main sections: 'Ethernet' and 'M-Bus'.
In the 'Ethernet' section:
- 'IP Address' is set to 192.168.0.141.
- 'SubNet Mask' is set to 255.255.255.0.
- The 'Gateway' checkbox is checked, and its IP address is set to 192.168.0.1.
- 'TCP Port' is set to 502.
In the 'M-Bus' section:
- 'Baudrate' is set to 38400.
- 'Parity' is set to ODD.
- The 'M-Bus Poll on request' radio button is selected.
- The 'Cyclic request' radio button is unselected.
- The 'Delay' field is set to 65535 seconds.
At the bottom, there are 'OK' and 'Cancel' buttons.

Figure 4: "Set Communication" window

M-BUS

By Pressing the **"M-Bus"** button from the main window for SW67044 (Fig. 3) the window "M-Bus Network" appears (Fig. 5).

SECTION NODES:

In the section "Nodes" it is possible to create the nodes of M-Bus line. In order to create a new node it is necessary to select which address use, selecting **"Primary ID"** or **"Secondary ID"**, to makes the requests and then insert the "Primary Address" (from 1 to 250) or the Secondary Address" (from 0 to 99999999) of M-Bus device in the field **"ID Node M-Bus"**. In the field **"Description"** it is possible to write a short description of the node.

In the field **"Node State"** it is possible to insert an address Modbus that contain the Status of the M-Bus device. If you don't need to know this, put this register at 0.

In the field **"Identification Number"** it is possible to insert an address Modbus that contain the Identification Number of the M-Bus device. You have to read two consecutive registers for knowing the value. If you don't need to know this, put this register at 0.

If the field **"Convert BCD in Integer Identification Num."** is checked the gateway converts the Identification Number that is normally expressed in BCD in a Integer.

In the field **"Swap Identification Num."** it is possible to select the swap mode of the Identification Number. If swap isn't necessary you have to select "None"; otherwise see the section "Swap Identification" (page 20) of this document for select the swap mode.

If the field **"Send SND_NKE"** is checked, the Gateway send the "SND_NKE" frame to start the communication.

In the field **"Send Reset App."** Is checked the gateway send the "Application Reset" command to the slave. In the field **"Variables List"** it is possible to select which type of variables definition to use.

If is selected "By Type" it is necessary to fill all fields, in the section Variables, with the correct values; otherwise if "By Position" is selected you can insert the progressive number of the variable that you need (page 14 for more information).

After that, pressing the **"ADD NODE"** button, a new node appears in the left side of the window. In order to modify a created node it is necessary to select the desired node, change the wrong items and then press the **"MODIFY NODE"** button.

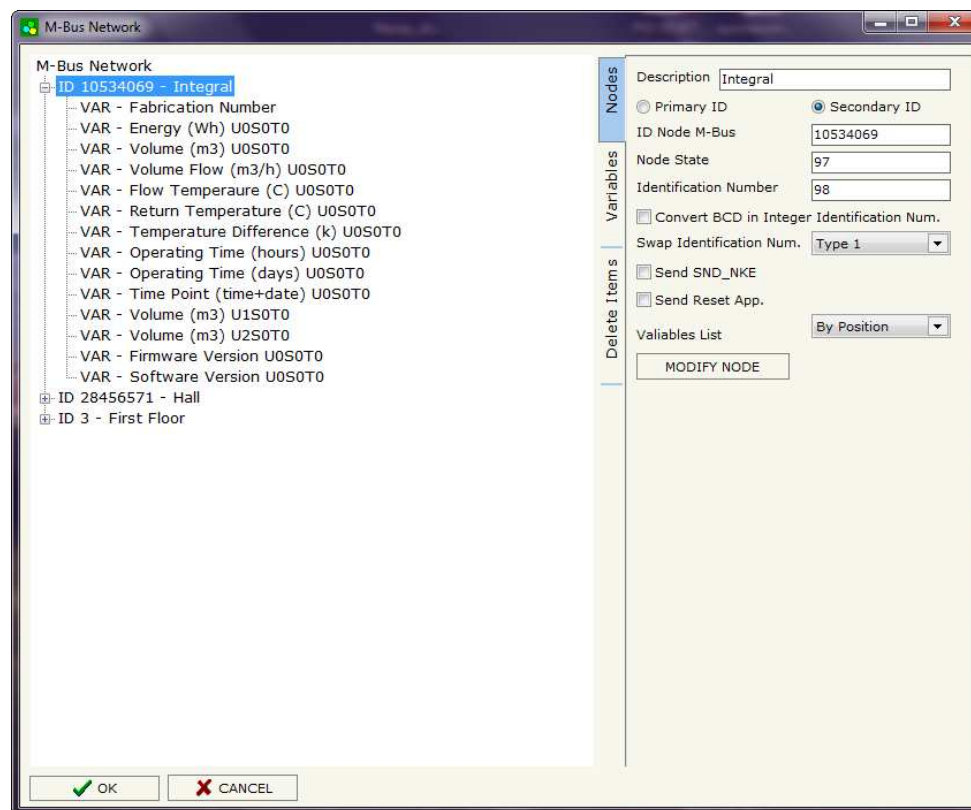
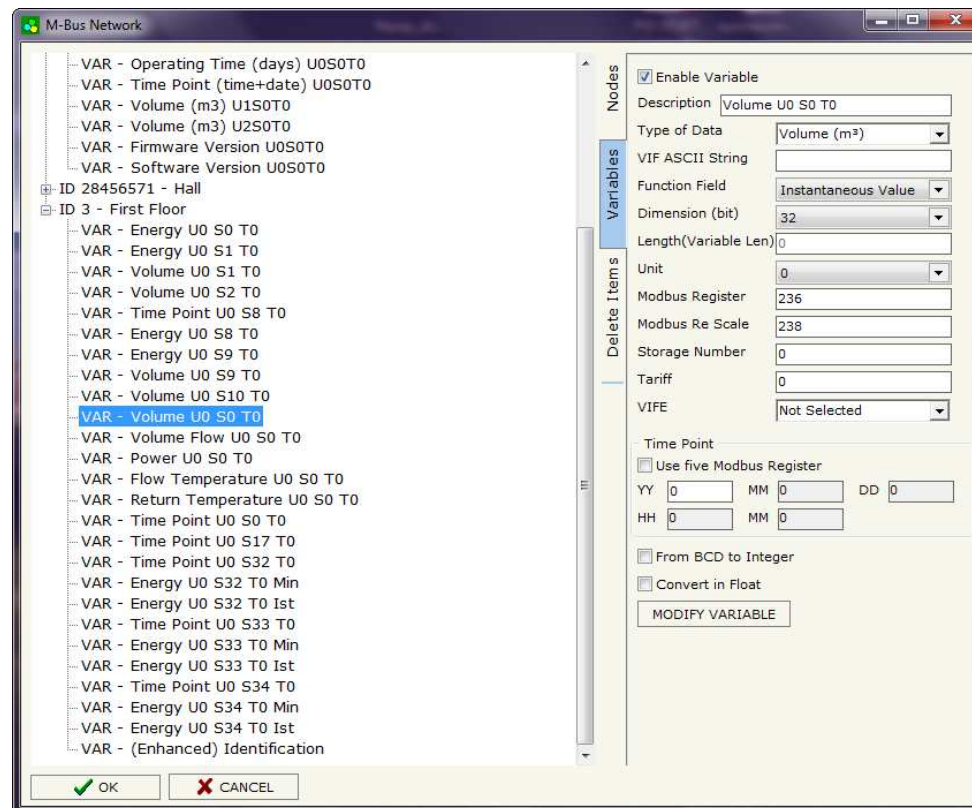


Figure 5: "M-Bus Network" window

SECTION VARIABLES (BY TYPE):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:

- To use the created variable the field **"Enable Variable"** must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field **"Description"** it is possible to write a description of the variable (it isn't a necessary information, it helps the readability of the tree of network);
- The field **"Type of Data"** is used to select the unit of measure;
- In the field **"VIF ASCII String"** insert the string of VIF. It is possible to use this field only if the "Type of Data" is "VIF is in ASCII";
- In the field **"Function Field"** it is necessary to select the type of data;
- The field **"Dimension"** is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field **"Length(Variable Len)"** insert the length of the data in the case of the dimension is "Variable Length";
- In the field **"Unit"** if it is necessary it is possible to select the unit of that variable. The Unit is used for indicates from which device the data come;
- In the field **"Modbus Register"** it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";
- In the field **"Modbus Re Scale"** it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";
- In the field **"Storage Number"** if it is necessary it is possible to insert the value of storage counter of that variable. With this field the slave can indicate and transmit various stored counter states or historical values, in the order in which they occur;
- In the field **"Tariff"** if it is necessary it is possible to insert the value of the tariff of that variable. The Tariff is used for indicates from which device the data come;
- In the field **"VIFE"** it is possible to select a sub-type of "Type of Data";



- If the field "**Use Five Modbus Register**" and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure). You have to insert the first Modbus Register.
- If the field "**From BCD to Integer**" is checked the Gateway converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes.
- If the field "**Convert in Float**" is checked the Gateway converts the data into Float type. Every variable occupies two consecutive Modbus Registers and the first one is the one defined in "Modbus Register". In this case the float value is multiplied by the "Modbus Re Scale" automatically.

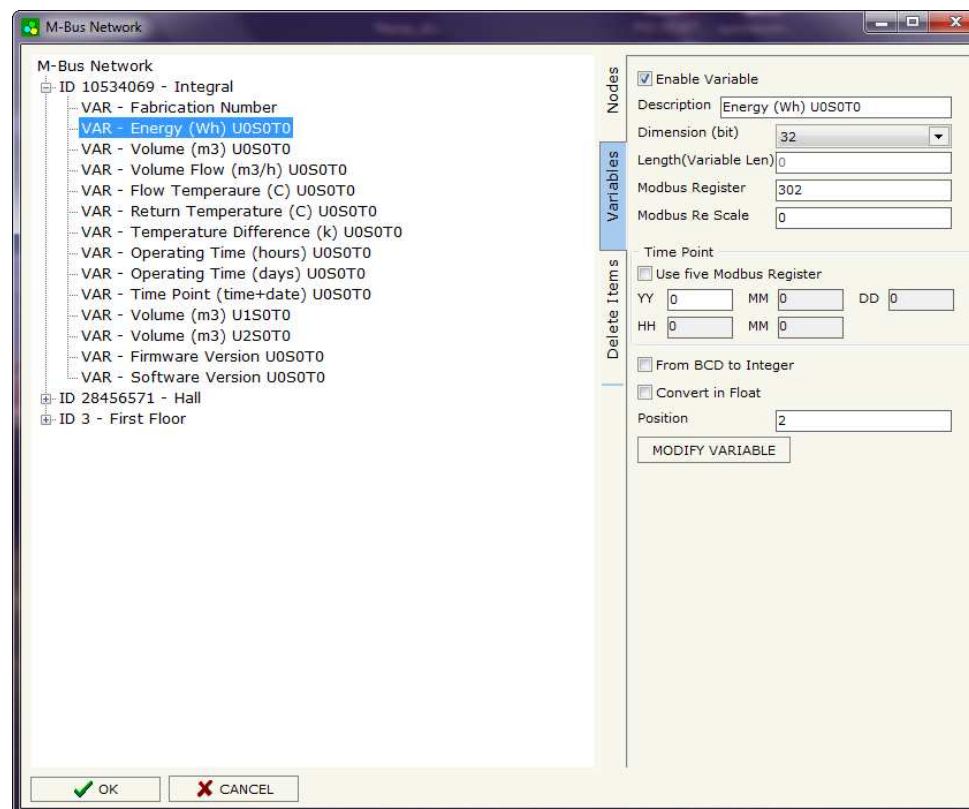
Having completed this fields, to add the variable the button "**ADD VARIABLE**" must be pressed.

In order to modify a created variable it is necessary to select the desired variable, change the wrong items and then press the "**MODIFY VARIABLE**" button.

SECTION VARIABLES (BY POSITION):

Selecting the desired node it is possible to add a variable. In order to create a new variable it is necessary to fill these items:

- To use the created variable the field **"Enable Variable"** must be checked. If you have created a variable but for the moment it is unused it is possible to uncheck the field "Enable Variable" without delete it;
- In the field **"Description"** it is possible to write a description of the variable (it isn't a necessary information, it helps the readability of the tree of network);
- The field **"Dimension"** is used to select the dimension of the variable (8, 16, 24, 32, 32 real, 48, 64 bit, Variable Length);
- In the field **"Length(Variable Len)"** insert the length of the data in the case of the dimension is "Variable Length";
- In the field **"Modbus Register"** it is necessary to insert the value of Modbus Register that contains the data of the M-Bus device. It is possible to insert from Modbus Register "1" to "60000";
- In the field **"Modbus Re Scale"** it is necessary to insert the value of Modbus Register that contains the value of measure scale. If the scale is not necessary, you have to insert the number "0" in this field. It is possible to insert from Modbus Register "1" to "60000";
- If the field **"Use Five Modbus Register"** and the "Type of Data" is "Time Point" it is possible to read the information of Year, Month, Day, Hour, Minutes on five consecutive Modbus registers without decoding the data (if not selected the values are the same of the reply of the slave device, so coded with a determinate structure (page 22 for more information)). You have to insert the first Modbus Register.
- If the field **"From BCD to Integer"** is checked the Gateway converts the BCD value of variable in Integer format. This happens only if the variable is in BCD format; if it isn't nothing changes;
- If the field **"SWAP"** is checked the byte of data of that variable are swapped. Example: from 0x01020304 to 0x04030201;
- In the field **"Position"** insert the number of the variable that you want on Modbus.



Example:

0x68 - Start Byte
0xBD - L Field
0xBD - L Field
0x68 - Start Byte
0x08 - C Field
0x02 - A Field
0x72 - CI Field

0x71 - Identification Number (Byte 4of4)
0x65 - Identification Number (Byte 3of4)
0x45 - Identification Number (Byte 2of4)
0x28 - Identification Number (Byte 1of4)
0x4D - Manufacturer (Byte 2of2)
0x6A - Manufacturer (Byte 1of2)
0x81 - Version
0x04 - Medium
0x3E - Access Number
0x27 - Status
0x00 - Signature (Byte 2of2)
0x00 - Signature (Byte 1of2)

0x04 - DIF
0x79 - VIF Identification
0x00 - Data (Byte 4of4)
0x00 - Data (Byte 3of4)
0x00 - Data (Byte 2of4)
0x00 - Data (Byte 1of4)

0x04 - DIF
0x06 - VIF Energy
0x00 - Data (Byte 4of4)
0x00 - Data (Byte 3of4)
0x00 - Data (Byte 2of4)
0x00 - Data (Byte 1of4)

0x44 - DIF
0x06 - VIF Energy
0x00 - Data (Byte 4of4)
0x00 - Data (Byte 3of4)
0x00 - Data (Byte 2of4)
0x00 - Data (Byte 1of4)

...
... Other Variables
...
0x55 - Check Sum
0x16 - Stop Byte

Fixed Data Header

Identification Number (or Secondary Address) putted in the selected register if "**Identification Number**" is checked

Status of the meter putted in the selected register if "**Node State**" is checked

First Variable (1)

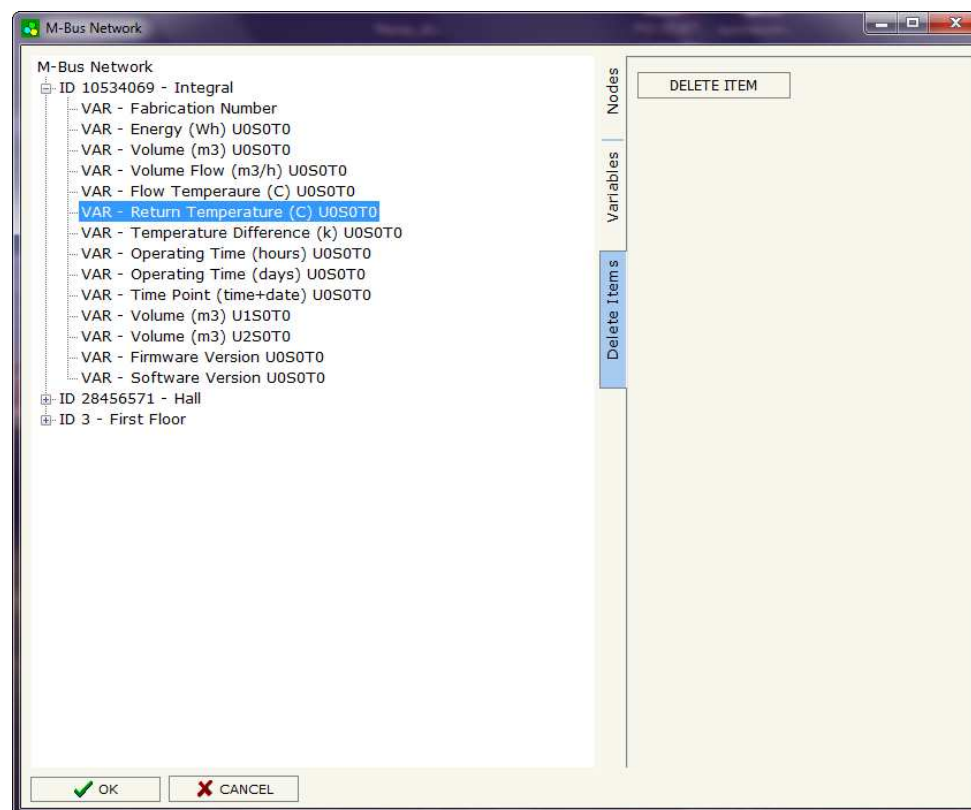
Second Variable (2)

Third Variable (3)

To be use in the "**Position**" field

SECTION DELETE ITEMS:

If it is necessary to delete a node or a variable, you have to select the node or the variable and then press the **"DELETE ITEM"** button.



Possible choices for the fields used to create a variable:

Type of Data:

- |_Energy (Wh)
- |_Energy (J)
- |_Volume (m³)
- |_Mass (Kg)
- |_On Time
- |_Operating Time
- |_Power (W)
- |_Power (J/h)
- |_Volume Flow (m³/h)
- |_Volume Flow Ext. (m³/min)
- |_Volume Flow Ext. (m³/s)
- |_Mass Flow (Kg/h)
- |_Flow Temperature (°C)
- |_Return Temperature (°C)
- |_Temperature Difference (K)
- |_External Temperature (°C)
- |_Pressure (bar)
- |_Averaging Duration
- |_Actuality Duration
- |_Type of data in VIFE
- |_Time Point
- |_VIF is in ASCII
- |_Unit for H.C.A.
- |_Fabrication No
- |_(Enhaced) Identification
- |_Bus Address

Function Field:

- |_Instantaneous Value
- |_Minimum Value
- |_Maximum Value
- |_Value During Error State

Dimension (bit):

- |_8
- |_16
- |_24
- |_32
- |_32 real
- |_48
- |_64
- |_Variable Length

VIFE:

- | | |
|--|--|
| <ul style="list-style-type: none"> _ Not Selected _ Credit of the nominal local legal currency units _ Debit of the nominal local legal currency units _ Access Number (transmission count) _ Medium (as in fixed header) _ Manufacturer (as in fixed header) _ Parameter set identification _ Model/Version _ Hardware Version # _ Firmware Version # _ Software Version # _ Customer Location _ Customer _ Access Code User _ Access Code Operator _ Access Code System Operator _ Access Code Developer _ Password _ Error flags (binary) _ Error mask _ Digital Output (binary) _ Digital Input (binary) _ Baudrate [Baud] _ response delay time [bittimes] _ Retry _ First storage # for cyclic storage _ Last storage # for cyclic storage _ Size of storage block _ Storage interval [sec(s)..day(s)] _ Storage interval month(s) _ Storage interval year(s) _ Duration since last readout[sec(s)..day(s)] _ Start (date/time) of tariff _ Duration of tariff (nn=01..11:min to day) _ Period of tariff [sec(s) to day(s)] | <ul style="list-style-type: none"> _ Period of tariff months(s) _ Period of tariff year(s) _ dimensionless/ no VIF _ Volts _ Ampere _ Reset counter _ Comulation counter _ Control signal _ Day of week _ Week number _ Time point of day change _ State of parameter activation _ Special supplier information _ Duration since last comulation [hour(s)..year(s)] _ Operation time battery [hour(s)..year(s)] _ Date and time of battery change _ Energy MWh _ Energy GJ _ Volume _ Mass _ Volume 0,1 feet^3 _ Volume 0,1 american gallon _ Volume 1 american gallon _ Volume flow 0,001 american gallon/min _ Volume flow 1 american gallon/min _ Volume flow 1 american gallon/h _ Power MW _ Power GJ/h _ Flow Temperature _ Return Temperature _ Temperature Difference _ External Temperature _ Cold/Warm Temperature Limit °F _ Cold/Worm Temperature Limit °C _ Cumul. count max power |
|--|--|

|_ per second
 |_ per minute
 |_ per hour
 |_ per day
 |_ per week
 |_ per month
 |_ per year
 |_ per revolution/measurement
 |_ increment per input pulse on input channel
 |_ increment per output pulse on output channel
 |_ per liter
 |_ per m³
 |_ per kg
 |_ per K (Kelvin)
 |_ per kWh
 |_ per GJ
 |_ per kW
 |_ per (K*I)(Kelvin*liter)
 |_ per V (Volt)
 |_ per A (Ampere)
 |_ multiplied by sek
 |_ multiplied by sek/V
 |_ multiplied by sek/A
 |_ start date(/time) of
 |_ VIF contains uncorrected unit instead of corrected unit
 |_ Accumulation only if positive contributions
 |_ Accumulation of abs value only if negative contributions
 |_ upper/lower limit value
 |_ # of exceeds of lower/upper limit
 |_ Date(/time) of begin/end of first/last lower/upper limit exceed

|_ Duration of limit exceed
 |_ Duration of first/last
 |_ Date(/time) of first/last begin/end
 |_ Multiplicative correction factor
 |_ Additive correction constant * unit of VIF (offset)
 |_ Multiplicative correction factor: 10³
 |_ future value
 |_ next VIFE's and data of this block are manufacturer specific
 |_ None
 |_ Too many DIFE's
 |_ Storage number not implemented
 |_ Unit number not implemented
 |_ Tariff number not implemented
 |_ Function not implemented
 |_ Data class not implemented
 |_ Data size not implemented
 |_ Too many VIFE's
 |_ Illegal VIF-Group
 |_ Illegal VIF-Exponent
 |_ VIF/DIF mismatch
 |_ Unimplemented action
 |_ No data available (undefined value)
 |_ Data overflow
 |_ Data underflow
 |_ Data error
 |_ Premature end of record

Swap Identification:

This field is used for select the Swap mode of Identification Number.

At the moment there are these possibilities:

- None;
- Type 1.

Examples:

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. not checked.

| None | Type 1 |
|--------------|--------------|
| 1000: 0x1234 | 1000: 0x5678 |
| 1001: 0x5678 | 1001: 0x1234 |

- Identification Number (Secondary Address): 12345678; Address Register 1000; Convert BCD in Integer Identification Num. checked.

| None | Type 1 |
|--------------|--------------|
| 1000: 0x00BC | 1000: 0x614E |
| 1001: 0x614E | 1001: 0x00BC |

To know the meaning of value read in the "Modbus Re Scale" field, you must follow this table (x = Value read in Modbus Re Scale):

| Description | Range Coding | Range |
|------------------------|---|----------------------------|
| Energy | $10^{(x-3)}$ Wh | 0.001 Wh to 10000 Wh |
| Energy | $10^{(x)}$ J | 0.001 kJ to 10000 kJ |
| Volume | $10^{(x-6)}$ m ³ | 0.001 l to 10000 l |
| Mass | $10^{(x-3)}$ kg | 0.001 kg to 10000 kg |
| On Time | x = 0 Seconds x = 1 Minutes x = 2 Hours x = 3 Days | |
| Operating Time | coded like On Time | |
| Power | $10^{(x-3)}$ W | 0.001 W to 10000 W |
| Power | $10^{(x)}$ J/h | 0.001 kJ/h to 10000 kJ/h |
| Volume Flow | $10^{(x-6)}$ m ³ /h | 0.001 l/h to 10000 l/h |
| Volume Flow Ext. | $10^{(x-7)}$ m ³ /min | 0.0001 l/min to 1000 l/min |
| Volume Flow Ext. | $10^{(x-9)}$ m ³ /s | 0.001 ml/s to 10000 ml/s |
| Mass Flow | $10^{(x-3)}$ kg/h | 0.001 kg/h to 10000 kg/h |
| Flow Temperature | $10^{(x-3)}$ °C | 0.001 °C to 1 °C |
| Return Temperature | $10^{(x-3)}$ °C | 0.001 °C to 1 °C |
| Temperature Difference | $10^{(x-3)}$ K | 1 mK to 1000 mK |
| External Temperature | $10^{(x-3)}$ °C | 0.001 °C to 1 °C |
| Pressure | $10^{(x-3)}$ bar | 1 mbar to 1000 mbar |
| Averaging Duration | coded like On Time | |
| Actuality Duration | coded like On Time | |
| Time Point | x = 0 Date x = 1 Time&Date | Data type G Data type F |
| Unit for H.C.A. | | dimensionless |

Data type F:

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|
| 2^7 | 2^6 | 2^5 | 2^4 | 2^3 | 2^2 | 2^1 | 2^0 |
| 2^{15} | 2^{14} | 2^{13} | 2^{12} | 2^{11} | 2^{10} | 2^9 | 2^8 |
| 2^{23} | 2^{22} | 2^{21} | 2^{20} | 2^{19} | 2^{18} | 2^{17} | 2^{16} |
| 2^{31} | 2^{30} | 2^{29} | 2^{28} | 2^{27} | 2^{26} | 2^{25} | 2^{24} |

Min (0 ... 59);

Hour (0 ... 23);

Day (1 ... 31);

Month (1 ... 12);

Year (0 ... 99);

Time Invalid (0=Valid, 1=Invalid);

Summer Time (0=Standard Time, 1=Summer Time);

Reserved (0).

Data type G:

| | | | | | | | |
|----------|----------|----------|----------|----------|----------|-------|-------|
| 2^7 | 2^6 | 2^5 | 2^4 | 2^3 | 2^2 | 2^1 | 2^0 |
| 2^{15} | 2^{14} | 2^{13} | 2^{12} | 2^{11} | 2^{10} | 2^9 | 2^8 |

Day (1 ... 31);

Month (1 ... 12);

Year (0 ... 99).

For example, if you have defined:

- Type of Data= Energy (J);
- Function Field=Instantaneous Value;
- Dimension= 32 bit;
- Modbus Register=150 (Register 151 declared implicitly because the dimension is 32 bit);
- Modbus Re Scale=152.

After the request, in Modbus register 150 you read 0x0004, in 151 you read 0x5678 and in register 152 is write 0x0006. The value obtained is: $284280 \times 10^{(6)}$ J.

UPDATE DEVICE:

Section "Update device" (Fig. 6):

In order to load the parameters or update the firmware in the gateway, follow these instructions:

- Turn off the Device;
- Connect the Null Modem Cable from your PC to the Gateway;
- Insert the Boot Jumper (For more info see Fig. 1);
- Select the COM port and press the "**Connect**" button;
- Turn on the device;
- Check the BOOT Led. It must blink quickly (For more info see Fig. 1);
- Press the "**Next**" button;
- Select which operations you want to do. You can select only "**Firmware**", only "**Project**" or both of them;
- Press the "**Execute update firmware**" button to start the upload;
- When all the operations are "OK" turn off the device;
- Disconnect the Boot jumper;
- Disconnect the RS232 Cable;
- Turn on the device.

At this point the configuration/firmware on the device is correctly updated.

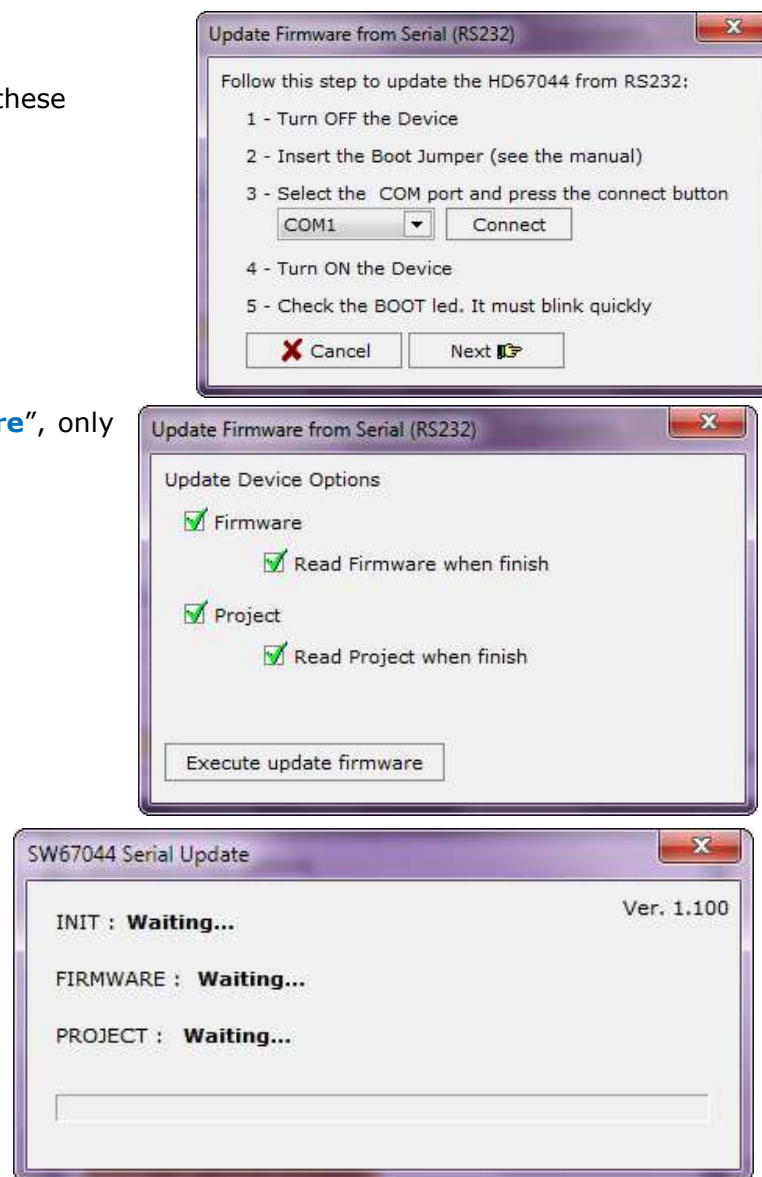


Figure 6: "Update Device" windows

**Note:**

When you install a new version of the software it is better if the first time you do the update of the Firmware in the HD67044M-xxx device.

**Warning:**

If the Fig. 20 appears when you try to do the Update before require assistance try these points:

- Check if the serial COM port selected is the correct one;
- Check if the serial is connected between the PC and the device;
- Try to repeat the operations for the updating;
- If you are using a dongle try with a native COM port or change the dongle;
- Try with another PC.

**Warning:**

With all codes of HD67044M you have to use the software "SW67044":
www.adfweb.com/download/filefold/SW67044.zip.



Figure 7: "Protection" window

CHARACTERISTICS OF THE CABLE:**Rs232:**

The connection from RS232 socket to a serial port (example one from a personal computer) must be made with a NULL MODEM cable (a serial cable where the pins 2 and 3 are crossed).

It is recommended that the RS232C Cable not exceed 15 meters.

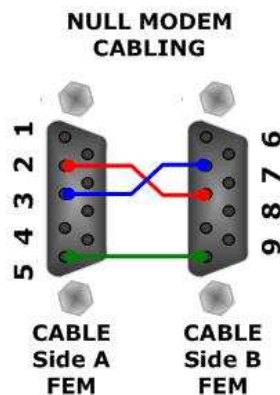
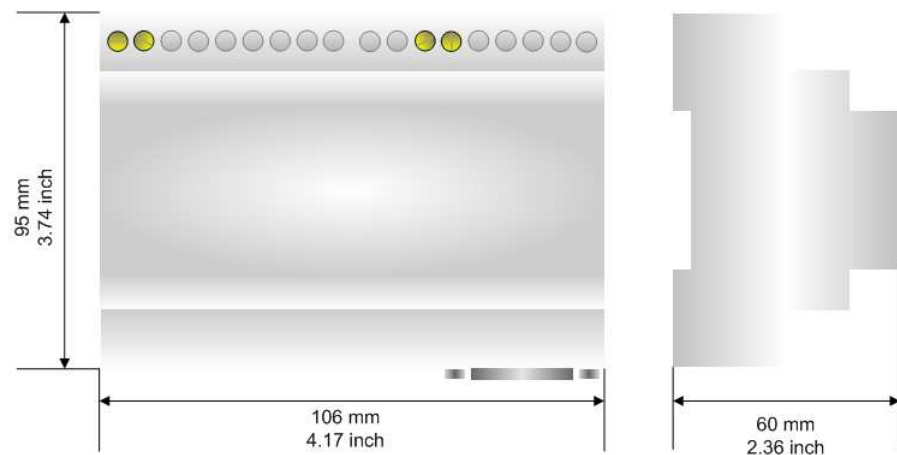


Figure 8: Null modem cabling

M-Bus:

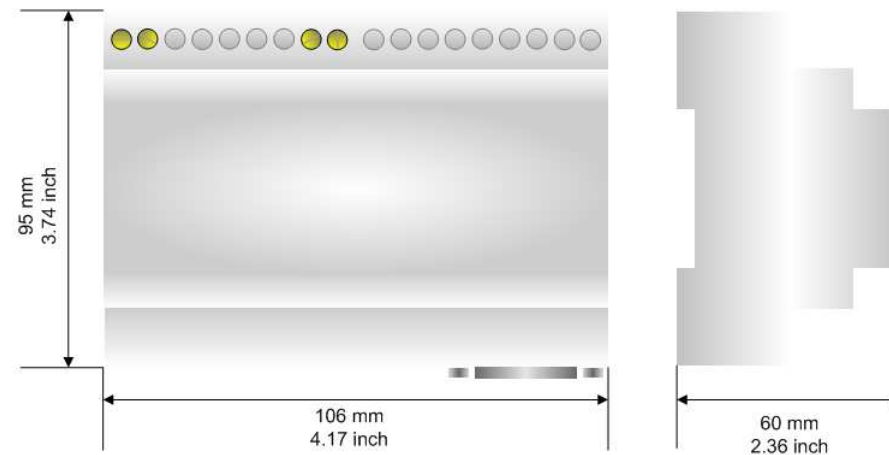
A two wire standard telephone cable (JYStY N*2*0.8 mm) is used as the transmission medium for the M-Bus. The maximum distance between a slave and the repeater is 350m; this length corresponds to a cable resistance of up to 29Ω . This distance applies for the standard configuration having Baud rates between 300 and 9600 Baud, and a maximum of 250 slaves. The maximum distance can be increased by limiting the Baud rate and using fewer slaves, but the bus voltage in the space state must at no point in a segment fall below 12V, because of the remote powering of the slaves. In the standard configuration the total cable length should not exceed 1000m, in order to meet the requirement of a maximum cable capacitance of 180nF. *(Taken from M-Bus specifics)*

MECHANICAL DIMENSIONS:



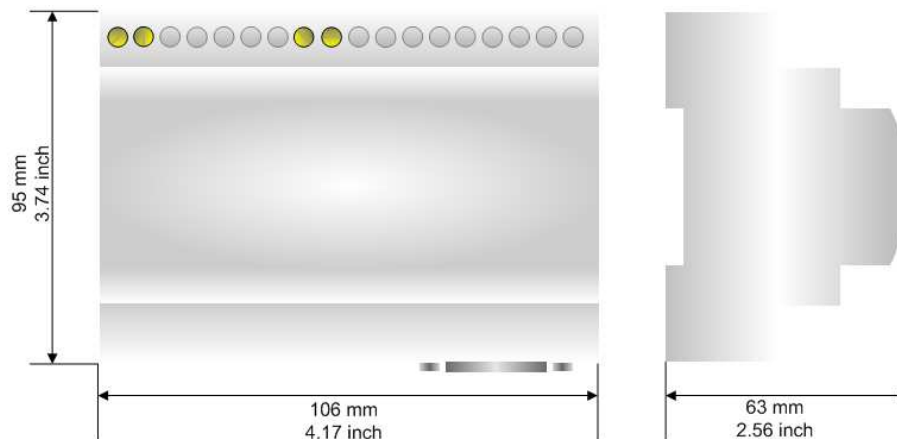
Housing: PVC
Weight: 200g (Approx)

Figure 9: Mechanical dimensions scheme for HD67044M



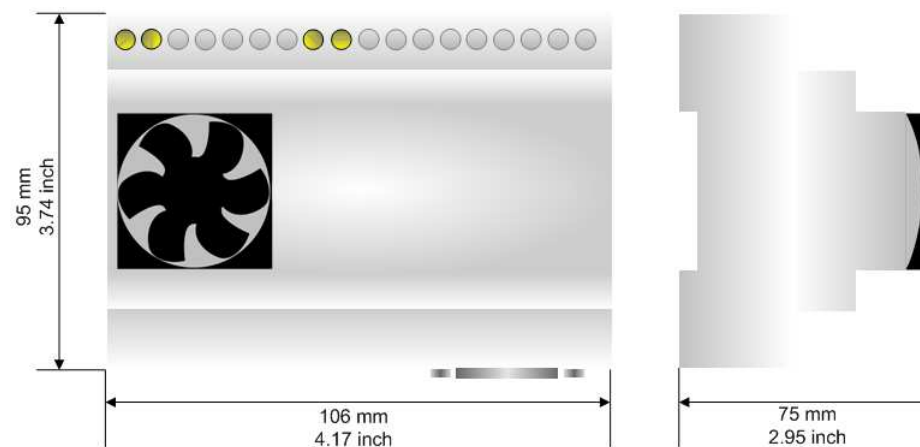
Housing: PVC
Weight: 200g (Approx)

Figure 10: Mechanical dimensions scheme for HD67044M-40, HD67044M-80



Housing: PVC
Weight: 200g (Approx)

Figure 11: Mechanical dimensions scheme for HD67044M-160



Housing: PVC
Weight: 200g (Approx)

Figure 12: Mechanical dimensions scheme for HD67044M-250

ORDER CODES:

- Order Code: **HD67044M** - Gateway M-Bus to Modbus TCP Server (up to 20 slaves connected to M-Bus)
- Order Code: **HD67044M-40** - Gateway M-Bus to Modbus TCP Server (up to 40 slaves connected to M-Bus)
- Order Code: **HD67044M-80** - Gateway M-Bus to Modbus TCP Server (up to 80 slaves connected to M-Bus)
- Order Code: **HD67044M-160** - Gateway M-Bus to Modbus TCP Server (up to 160 slaves connected to M-Bus)
- Order Code: **HD67044M-250** - Gateway M-Bus to Modbus TCP Server (up to 250 slaves connected to M-Bus)

ACCESSORIES:

- Order Code: **AC34107** - Null Modem Cable Fem/Fem DSub 9 Pin 1,5 m
- Order Code: **AC34114** - Null Modem Cable Fem/Fem DSub 9 Pin 5 m
- Order Code: **AC34001** - Rail DIN - Power Supply 220/240V AC 50/60Hz – 12 V AC
- Order Code: **AC34002** - Rail DIN - Power Supply 110V AC 50/60Hz – 12 V AC

WARRANTIES AND TECHNICAL SUPPORT:

For fast and easy technical support for your ADFweb.com SRL products, consult our internet support at www.adfweb.com. Otherwise contact us at the address support@adfweb.com

RETURN POLICY:

If while using your product you have any problem and you wish to exchange or repair it, please do the following:

- 1) Obtain a Product Return Number (PRN) from our internet support at www.adfweb.com. Together with the request, you need to provide detailed information about the problem.
- 2) Send the product to the address provided with the PRN, having prepaid the shipping costs (shipment costs billed to us will not be accepted).

If the product is within the warranty of twelve months, it will be repaired or exchanged and returned within three weeks. If the product is no longer under warranty, you will receive a repair estimate.

PRODUCTS AND RELATED DOCUMENTS:

| Part | Description | URL |
|---------|---|--|
| HD67120 | Converter Ethernet to RS232/RS485 | www.adfweb.com?product=HD67120 |
| HD67119 | Converter USB 2.0 to RS485 Isolated | www.adfweb.com?product=HD67119 |
| HD67507 | Gateway Modbus TCP Server to RTU Master | www.adfweb.com?product=HD67507 |
| HD67510 | Gateway Modbus TCP Client to RTU Slave | www.adfweb.com?product=HD67510 |